

Capabilities, Critique and ICTD

Yingqin Zheng, Bernd Carsten Stahl

Abstract--This paper explores what insights can be drawn from critical theory to enrich and strengthen Sen's capability approach in relation to technology and human development. The two theories share some important commonalities: both are concerned with the pursuit of "a good life; both are normative theories rooted in ethics and meant to make a difference, and both are interested in democracy. The paper provides a brief overview of both schools of thought and their applications on technology and human development. Three areas are identified where critical theory can make a contribution: conceptually, providing a critical account of individual agency; enriching the concept of technology beyond the simplistic notion of goods and resources; and methodologically, sensitising towards reification and hegemony of scientific tools, and emphasising reflexivity of researchers.

Key words -- Capability Approach (CA), Critical Theory (CT), Development, Technology

I. INTRODUCTION

Amartya Sen's capability approach (CA) is based on the critiques of opulence-focused approaches (focused on income, commodity command) or utilitarian approaches (focused on happiness, desire-fulfilment) which are typically found in traditional welfare economics [1]. The word "capability" as used by Sen differs from its everyday sense which usually refers to trained potentials, including skills, abilities and aptitudes. Rather, "capability" in this approach reflects the real opportunities (environmental opportunities and individual abilities) that a person has to lead a life s/he values [2]. Deneulin [3] summarises three "cornerstones" that Sen's CA is built upon: First, its concern with "the expansion of freedom ... both as the primary end and as the principle means of development" [4, p. xii]. Second, the centrality of "individual agency" in addressing human deprivation. Third, its emphasis on participation.

While Sen's capability approach (CA) has made major contributions in the research and practices on human development, e.g. poverty alleviation, gender equality, and democracy, it has until recently been rarely applied to investigate the implication of design and adoption of information and communication technology (ICT) in society. Concepts and principles of the CA have been

drawn upon to discuss the means and ends of ICT for development [5], evaluation of ICT projects [6], empowerment [7], [8], the global digital divide [9], social inclusion [10], and theoretical exploration on applying the CA on ICT and human development [11], [12].

Adopting a CA perspective of ICT, technology is typically seen as embedded in the process of human development, that is, to enhance the capabilities of individuals to lead a life in ways that they have reasons to value, rather than seen as an end in itself. Moreover, the centrality of "agency" in Sen's capability approach allows us to challenge the perception of potential users of ICT as passive receivers of innovations, especially when technologies are transferred to the third world from more advanced economies [13], and when technologies are imposed on local users under the claims that these particular technologies are "good for them" [14]. Applying Sen's CA on ICT for development, the agency of ICT users are brought to attention, thus highlighting the needs and aspirations of the people whose interests are affected by the innovations. Zheng [11] suggests that two implications result from the incorporation of individual agency in studying ICT for development (ICTD). The first relates to the need for public discussions, participation, and social inclusion in the process of ICT adoption and diffusion, and the second relates to the evaluation of ICT adoption in terms of the extent to which it meets the needs and expectations of users [6], rather than of the rate of diffusion, the extent to which it fulfils the intentions of the designers, or economic outcome.

On the whole the scholarship of applying Sen's capability approach on ICTD is at an early stage, and there is plenty of space for such work to develop conceptually, theoretically and methodologically. In this paper we will explore two conceptual issues here. Firstly, almost all of the work that incorporate ICT into the CA framework has an implicit perception of technologies as goods and resources, which are independent of values and beliefs. For example, Zheng [11] proposes a view of seeing ICT as commodities, meaningful in the light of its contribution to the users' capability set, i.e. the real opportunities that the individual has to lead a life s/he considers valuable. Such a view implies that technology is neutral and can be readily drawn upon to serve the purposes of human development. While this may be valid at some level - and is useful to steer away from the idea that technological innovation as a valuable end in its own right - the neutrality assumption could be

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Yingqin Zheng and Bernd Carsten Stahl are with the Center of Computing and Social responsibility, Department of Informatics, Faculty of Technology, De Montfort University(email: yzheng@dmu.ac.uk; bstahl.dmu.ac.uk)

overly simplistic and problematic at other levels. Scholars of technology studies and information systems are very likely to protest against it. Is there space for a sophisticated and critical view of technology?

Another aspect to be mentioned here is the notion of individual agency, which Sen considers essential to addressing deprivations. Sen defines agency as the freedom to set and pursue one's own goals and interests, which underlines his concept of development: "[d]evelopment consists of the removal of various types of unfreedoms that leave people with little choice and little opportunity of exercising their reasoned agency [4, xi]." While it is recognised that individual agency is embedded in specific socio-cultural environment [15] [16], and that there is still space for the agency to be evaluated and appraised [17], Sen is reluctant to theorise on how individual agency is restricted and its implications for operationalising the CA. This seems to be one of the areas of the CA seems to have been left "incomplete" [18]. As Deneulin [3] points out,

"If the capability approach is a theory guiding and assessing development policies according to the capabilities people have reason to choose and value, given the structures of inequality within which people express their 'good reasons' to value certain capabilities, it seems that the approach crucially requires a critical account of the 'good reasons' people may have to value certain capabilities. (p. 32)"

To address these issues we propose to draw upon critical theory (CT) and see whether there are elements from this school of thought that can be shed light on a more critical account of both technology and individual agency when applying the capability approach on ICTD. The reason we choose critical theory is that it is similar to the capability approach in many respects. They both constitute schools of thought that are meant to make a difference - to improve individual and social lives; both are normative theories rooted in ethics; they share an interest in democracy, and both are concerned with the pursuit of "a good life". They develop different streams of ideas to support freedom, empowerment and emancipation. It is thus a reasonable question to ask whether and in what ways these two approaches can learn from each other. In this paper we focus on what the CA can learn from CT.

Both approaches defy simple definitions. Sen's CA was intentionally left incomplete [18], and has been extended, enriched and applied by various scholars from diverse disciplines. CT is used as a label for a rich body of theories which encompass diverse critical approaches and methodologies. Bearing the diversity and complexity in mind, for the purpose of simplicity of this paper, we will refer to them as though they were singular theories,

but will elaborate on internal differences where necessary.

The rest of the paper starts by reviewing the capability approach and ICT, followed by an introduction to critical work in information systems and technology. The subsequent section explores in detail aspects of critical theory in terms of their contribution to applying Sen's capability approach on technological innovations, including conception of technology, agency and methodological issues. The paper concludes by pointing towards ways in which the cross-fertilisation of CT and CA can lead to tangible results that further both research agendas.

II. CAPABILITY APPROACH, CRITICAL THEORY, AND TECHNOLOGY

This section provides the theoretical background to main thesis of the paper. It outlines the main characteristics of CA and CT in relation to the role of technology.

A. Sen's Capability Approach

Sen's capability approach (CA) was developed and refined over three decades, after the Tanner lecture in 1979, in a number of books and journal articles across disciplines [4], [19] - [21]. As most of Sen's work addresses the economics field, it is not easily accessible to a wider audience. His writings on the topic have been synthesized by various authors including Alkire [22] and Robeyns [23]. The major constituents of the capability approach are "functionings" and "capabilities". Functionings are the "beings and doings" of a person, whereas a person's capability is "the various combinations of functionings that a person can achieve. In other words, functionings are considered constitutive of well-being, and refer to realized achievements and fulfilled expectations; whereas the notion of capabilities "represents a person's *freedom to achieve well-being*" [23, p.49, original italics], and refers to effective possibilities of realizing achievements and fulfilling expectations. Thus, the CA is not only concerned with the functioning levels of people, but also with their capabilities.

Based on the distinction between functionings and capabilities, the CA differentiates from other economic approaches to poverty, inequality and justice by distinguishing "means to achieve" (what one values), "freedom to achieve", and "actual achievement" [19],[24]. While approaches that focus on commodity demand or level of income only address the means of achievement, the CA puts the "freedom to achieve" at the central stage of assessment. It is on this basis that Zheng [11] conceptualises ICT to be a type of commodities that serve as "means to achieve", distinguishing it from the "the freedom to achieve", namely, the capability set of the individuals that enable them to

take advantage of goods and resources towards furthering their valued goals in life. The actual achievement of functionings is a result of personal choice, subject to personal preferences and other factors of decision-making mechanisms, from the capabilities available. It is recognised that the extent to which people can generate capabilities from goods and services are influenced by three sets of conversion factors – personal, social, and environmental characteristics [19, p.79-87].

The consideration of interpersonal variations among human beings differentiates the capability approach from other theories in that it explicitly distinguishes different spaces of equality. Equality in one space to lead a valuable life, e.g. income, does not necessarily mean equality in life opportunities to achieve it, e.g. access to quality healthcare [1]. This has great significance in assessing inequality, hence the question “equality of what?”, which Sen argues is “truly central to understanding the distinction between different ethical approaches to social arrangements” [19, p. 130]. The capability approach thus proposes a different “evaluative space” [21, p. 33], i.e. the plurality of functionings and capabilities, as opposed to income, utility or desire-fulfilment in traditional approaches. From this perspective, poverty should be seen as “the deprivation of basic capabilities rather than merely as lowness of incomes [4, p.87]”, which is only of instrumental importance. For example, African Americans in the United States, though richer than people in the third world, have “absolutely” lower chance to reach mature age than people in, say, China, Sri Lanka or parts of India [4].

The concept of agency is fundamental in seeing Sen’s focus on substantive individual freedom – “what the person is free to do and achieve in pursuit of whatever goals or values he or she regards as important [17, p. 203].” In other words, an individual is an “agent”, as opposed to a “patient” whose well-being or the absence of well-being is the only concern [25]. There are two aspects of “substantive individual freedom”: “well-being freedom” and “agency freedom” [19, p.57]. The former is one’s freedom to achieve things that are constitutive of one’s well-being, while the latter is one’s freedom to “bring about the achievements one values and which one attempts to produce” [ibid.], which may include furthering the well-being of others, respecting social and moral norms, or acting upon personal commitments and the pursuit of a variety of values. The centrality of agency in Sen’s capability approach critically differentiates it from Nussbaum’s [26] capability approach, which defines a concrete list of basic capabilities. Instead, Sen insists that the list and weighting of valued capabilities should be defined

by individuals themselves. We will explore Sen’s concept of agency further in the next section.

Capabilities studies have thrived in the last decade and lots of efforts and progress have been made in applying the CA in empirical studies (see e.g. [27], [18], [2] for more detailed discussions). The capability approach is relatively new to the social studies of ICT. One of the earlier applications is Madon [6] who adopts the capability approach to go beyond traditional evaluation criteria on e-governance initiatives in the state of Kerala, India. Rather than measuring only expenditure, infrastructure, access and skills, she argues that we should also look at what people can or cannot do with the ICT applications offered, and how effectively people benefit from them. Johnstone [7] seeks to broaden the research agenda of computer ethics by drawing insights from the CA. More recently, Zheng and Walsham [10] apply concepts of the CA to examine how social exclusion in the e-society can manifest as inequalities in many different “spaces”. A more systematic investigation of the CA in the IS field is provided by Zheng [11] who presents an overview of the CA for ICT researchers and explores different ways of applying a CA perspective on studying the role of ICT in socio-economic development. Kleine [12] presents the Choice Framework as a way to operationalise the Capability Approach to development. As whole, the application of the CA in IS research is at an early stage and is in need of further exploration and development.

B. Critical Theory of ICT

Critical theory has a rich history and spans a large number of approaches to research. In this paper we are predominantly interested in critical theory as it pertains to and has been applied to ICT and information systems. There are two clearly recognisable critical discourses in ICT, namely critical research in information systems, a discourse predominantly among information systems scholars, and critical theory of technology, which is supported by philosophers of technology. This section will review both discourses and synthesise them as critical research of ICT.

Critical Social Research in Information Systems

Information systems (IS) is a field of practice but also of academic inquiry. It is often defined by the interrelation of technical and social aspects. The critical approach to information systems is often presented in terms of a “research paradigm” [28] as distinct from interpretivist and positivist IS research. While there has been some activity in critical research in IS since the 1980s, the level of activity and visibility has recently picked up with the publication of several dedicated volumes [29], [30], [31] and special journal issues. Topics range from

the perspectives of post-colonial influences [32], gender [29] to discourses and power relationships [33].

Stahl [34] suggests the critical intention is core to CSISR. It is based on the perception that social reality can be improved and that research has the task to engage in this. Cecez-Kecmanovic [35, p. 19] puts it as follows: "*Critical IS researchers produce knowledge with the aim of revealing and explaining how information systems are (mis)used to enhance control, domination and oppression, and thereby to inform and inspire transformative social practices that realize the liberating and emancipatory potential of information systems.*" This introduces the core concept behind the critical intention, namely that of emancipation.

It should be noted that critical theory, even in a relatively clearly circumscribed field such as CSISR, can better be understood as an umbrella label covering different theoretical approaches. A typical meaning of the term is that it is theory that has been inspired by Marxist critique of capitalism. More specifically, the term critical theory is often linked to work related to the Frankfurt School of social research [36]. However, there has been some reaction to the dominance of Frankfurt School work, and particularly the dominance of work inspired by Habermas in CSISR [37]. In current CSISR discourses one can therefore find references to a wider body of theories, including Michel Foucault who has a strong presence. Other theoretical references include critical management studies, postcolonial theory.

Critical Theory of Technology

The critical theory of technology (CTT) draws on similar sources and shares similar concerns with the CSISR, but the two discourses appears to be largely separate. A central figure of CTT is Andrew Feenberg [38] – [40], a student of Marcuse's, who has built much of his work on early Frankfurt School work. However, the strong initial influence of the Frankfurt School has been supplemented by work of Heidegger and Ellul as well as postmodernists, constructivists and others .

CTT seems to be more closely linked to philosophy as a reference discipline than CSISR, which has a stronger affinity to a sociological background, covering philosophical topics such as the conceptual basis and the ontological nature of technology. The nature of technology is a core concern of CTT. Technology is generally recognised as being socially shaped and constructed. It is not neutral but includes values and preferences. The eventual shape that a technology takes is dependent on the fit between devices and interest and beliefs of social groups [39].

An important aspect of this non-neutrality of technology is its relation to power. Technology

represents power and can be more powerful than political power. Technology can be used to delegate power. This view reflects Marcuse's [42] observation that "Technology serves to institute new, more effective, and more pleasant forms of social control and social cohesion." CTT emphasises the ambiguity of technology, the fact that it can be used for rationalising power structures as well as instituting empowerment. The way in which these affordances are realised is strongly influenced by the socio-economic environment in which technologies are developed and used. CTT therefore has an interest in the way in which capitalist structures facilitate or obstruct the achievement of potentials.

Commonalities of the Critical Approaches: CTICT

A more in-depth comparison of the two discourses in CSISR and CTT would be desirable as a contribution to an overall critical theory of technology but this would lead beyond the confines of the present paper. For the purposes of the current paper it will suffice to extract the common features they share, in particular with regards to ICT. We will call this amalgamation of CTT and CSISR the critical theory of ICT (CTICT).

CTICT stands for the recognition that ICT has the potential to improve social reality and promote emancipation but often has opposite effects. Critical research aims to address this by epistemological means (e.g. exploring the nature and consequences of ICT) but aims to go beyond this. The awareness of the socially constructed nature of technology, the ability to describe interpretive flexibility lead to a sensitivity of the relationship between technology and power. Social and economic structures influence the values on which technologies are built and thereby the affordances they offer to users. These insights have both theoretical and practical relevance and would be able to inform our development and use of technology in order to contribute to the development of a better society.

III. WHAT CA CAN LEARN FROM CT

Having briefly introduced the two theoretical approaches to be discussed in this paper, we can now proceed to the discussion of the way in which the capability approach can learn from critical theory. While this discussion is based on general and philosophical considerations, we emphasise the specific relevance of CA and CT in the area of ICT.

A. Agency, Ideology and Hegemony

It is mentioned above that the vision of development from the capability perspective is rooted in the individuals, and claimed to adhere to "ethical individualism" (in distinction from methodological individualism). The ultimate goal

of development, according to the capability approach, is the expansion of individual freedom, that is, for individuals to lead a life that they consider valuable. The aspect of “agency freedom”, which is a critical appeal of the CA, was not very well developed partly because it is particularly difficult to operationalise [2]. Most development approaches have concentrated on the well-being aspect, such as income, education, and healthcare. In response to the neglect of agency freedom and agency achievement in political discourses and interpretation of Sen’s work, Crocker [41] proposes the label of the “the agency-focused capability approach” or “an agent-oriented approach” .

The emphasis on individual agency gives rise to critiques on Sen’s work as being overly individualistic, and paying insufficient attention to groups and social structures (e.g. [43], [44], [3]). To a certain extent, Sen explicitly takes into account social environment, societal structures, and culture by distinguishing between the concepts of functionings and capabilities, and by recognising the conversion factors from resources to functionings [25]. For example, on the topic of identity and violence, Sen [16] expresses concern with deprivation of the freedom to think and the freedom of choice due to singular identification with a particular ethnic group, religion, or way of living. While such restrictive views of identity are often historical legacies, they are also partly results of social policies. In his research on gender inequality in India, Sen [15] argues that the fact that married women tend to value their contribution to the household as lower than their breadwinner husband is based on general social perceptions of market evaluations of work, and hence the gender contributions to social goods. Such a tendency is further compounded by their already low bargaining power in the family, thus resulting in their resignation to fate.

Despite an implicit concern with power relations and unjust social structures, Sen does not provide a full account of and theorisation on societal structures and constraints on personal choices. This is one of the areas that CA remains open and needs to be complemented by other theories. Robeyns [45] points out that one could use the capability approach with theories of choice and personal responsibility that do not acknowledge societal structures and constraints, which will have ultimately far reaching consequences for evaluative exercises.

In complimentary to this “weakness” of the capability approach, the critical theory focuses on the structural conditions of individual agency. Of primary importance among those conditions is the economic constitution of society, that is, the way in which capitalist systems structure agents’ options. Critical scholars tend to point to the importance of

historical backgrounds in understanding social situations, and underline the ideological character of social structures which limit personal freedoms.

The critical theory provides a rich theoretical repertoire in relation to the constraints on and boundedness of human agency. Two central concepts in this vocabulary of CT are ideology and hegemony. Ideologies are particular and dominant worldviews that advantage some and disadvantage others [46], [47], [48]. Ideologies are not simply falsehoods. Rather, they constitute central parts of the shared worldview of a society or group [49]. As such they can often even be supported by empirical evidence [50] (Gouldner, 1976) and often accepted by groups or society as correct descriptions of reality. However, from a critical perspective they can be seen as partial and alienating. Good examples of ideologies are the stereotypes linked to race and gender.

Addressing ideology is not a simple solution but an ongoing process which pervades critical research. Ideologies can only persist if they evade critical questioning and analysis. They must blend into the background in order to remain stable. The mechanism by which this is achieved is sometimes called hegemony. Hegemony renders ideology invisible, often by rendering it natural and beyond discussion. The concept of hegemony is closely linked to Gramsci’s work whose main question was why people acquiesced to the oppression they were subjected to [51] (Kincheloe & McLaren, 2005). Foucault [52], [53] (1977; 1980) also famously argues that inequalities and power relations operate not solely through direct forms of repression but often through less visible strategies of normalization, as in the panopticon metaphor.

Deneulin [3] draws upon Ricoeur’s ethical vision to improve Sen’s notion of individual agency to that of *social-historical agency*, which refers to what human beings can really do or be given the particular socio-historical structures in which they are living. We propose the concept of *situated agency* to express the idea that individual agency is not only a product of specific socio-historical settings, but also situated in a sometimes invisible or taken-for-granted network of ideology, and participate in the production and reproduction of these socio-historical structures and ideological tenets. Such a concept has important implications for ICT and social development, as it gives rise to a sensitivity towards deep-seated power structure and rationalities.

For example, an participatory approach in development, which Sen himself strongly advocates and is popular in most development projects, may disguise or even strengthen incipient articulation of power embedded in social and cultural practices, hence the “tyranny of participation” [54] (Cooke and Kothari, 2001). It is possible that participatory methodologies may reify

existing inequalities and affirm the agenda of elites and other more powerful actors [55] (Kothari, 2001). In studies on ICT and development, social conditions and cultural values are often perceived as merely contexts of ICT adoption, or sometimes as barriers [13]. A critical capability approach that conceptually and methodologically incorporates *situated agency* as a key element would allow us to critically evaluate the design of social arrangement and of the basis of cultural norms as part of the assessment of well-being and agency freedom.

B. Technology, Capabilities and Critical Perspectives

The Critical Theory of ICT can be used in addition to the capability approach in the assessment of motivations for adoption and social consequences of ICT in modern life. One of the concerns of CTICT is how technology can be subjected to democratic control. Again, this takes up a theme formulated by scholars of the Frankfurt School such as Habermas or Marcuse and tries to find present solutions to it. This requires a better understanding of the nature of technology and overcoming determinist positions such as those of Heidegger and Ellul. It raises practical issues concerning the design and regulation of technology. Importantly, it explicitly covers political questions of how democratic ideals can be brought to bear in modern socio-technical systems. This may point to participative development approaches but even introduce an element of Luddism [56] (Schot & Rip, 2006, p. 264) into political debates surrounding technology, where Luddism is understood as an approach to "create and maintain space for sociotechnical criticism".

Work in CTICT is also strong in pointing out areas and issues of alienation and oppression and the different roles that technology can play in this. Typical topics of interest are those that affect emancipation or its potential. Prime among them are power-related issues, in particular those where power is related to technology. Examples are control and surveillance technologies. Brey [57] (2008) posits that a critical (political) theory of technology has to provide answers to the following four questions:

- 1) The theoretical question: how can technology play a role in the distribution and exercise of power?
- 2) The factual question: what is the role of technology in the distribution and exercise of power in contemporary society?
- 3) The normative question: what role should technology have in the distribution and exercise of power in society?
- 4) The practical question: what steps can be taken to move closer to this ideal?

The CTICT therefore explicitly and directly addresses the issue of technology and distribution

of power, which is exactly what is lacking in the capability approach. Another contribution of the CTT is revealing its ideological qualities and hegemonic functions. Ideologies may be socially accepted views such as the legitimacy of hierarchical management or of the imperative of profit maximisation. Ideologies are part of all collective constructions of reality and therefore a necessary consequence of a social constructivist worldview. They may even have positive consequences when they allow for the development of positive views of experiences [58] (McAulay et al., 2002). Technology can then serve as hegemonic means by supporting and rendering invisible such ideologies [59], [39]. (Saravanamuthu, 2002; Feenberg, 1999). At the same time, technology itself can have an ideological status, for example when technology is equated with progress and progress is assumed to be unquestionably desirable; when technology represents "expert knowledge" that exercises "disciplinary power" [53] (Foucault, 1980); or when technology embodies contested social regulations, for example through digital rights management. Hegemonic means to uphold the ideological quality of technology can then be drawn from the environment in the form of customs, agreements, or the law.

A heightened sensitivity towards the interpretive flexibility of technology, the hegemonic potential of ICT and its role in (re)configuring distribution of power may be able to help address the lack of recognition of technological agency and power relations when applying the CA on technological changes and social development.

C. Methodological Issues

A further area where critical theory may be able to make a contribution to the operationalisation of the capability approach lies with methodology. There are numerous attempts to operationalise CA, which has led to the development of a considerable literature on how to do this that other scholars can build on. When talking about methodologies of applying the CA it usually refers to the accumulated quantitative and qualitative methods in identifying and measuring capabilities. For example, Alkire's [22] book *Valuing Freedom* has taken Sen's capability approach forward to develop a framework for specifying valuable capabilities, applied on cases studies of non-governmental organization activities of poverty reduction.

However this is certainly not the only way the CA can be applied. Robeyns [18] (2006) categorizes ten types of existing capability applications: general assessment of human development of a country; assessment of small scale development projects; identification of the poor in developing countries; poverty and well-being assessments in advanced economies; an analysis of deprivation of disabled people; the assessment of gender

inequalities; theoretical and empirical analyses of policies; critiques on social norms, practices and discourses; and finally, the use of functionings and capabilities as concepts in non-normative research. For instance, In terms of policy application, the capability approach has provided the foundations of the human development approach adopted by the United Nations Development Program to develop the human development index.

CTICT does not have a clearly established methodology, which can be seen as regrettable [60] (McGrath, 2005) but it is arguably a consequence of the very idea of critical theory, namely to question assumptions and beliefs including the reflexive questioning of beliefs of the researcher. Indeed, the core principles of critical research have important methodological implications in the design of theoretical and empirical social research of ICT. As Feldman [61] rightly points out, “to avoid the pitfalls of institutionalising capabilities in ways that limit it to a technical assessment or measurement tool, it is crucial to remain attentive to the power and political interests that help to constitute its meanings and practices.”

To retain a critical consciousness in operationalising the capability approach, it may be useful to refer to the six criteria that Klein [62] (2009) draws on Basden [63] to suggest that a piece of research must fulfil in order to count as critical:

- 1) Being concerned with the conditions of human existence that facilitate the realization of human needs and potentials;
- 2) Supporting a process of critical self- reflection and associated self- transformation;
- 3) Being sensitive to a broader set of institutional issues relating particularly to social justice, due process and human freedom;
- 4) Incorporating explicit principles of evidence given (or an explicit truth theory) for the evaluation of claims made throughout the research process;
- 5) Incorporating principles of fallibility and self- correction (growth of knowledge through criticism, i.e. the principle of fallibilism);
- 6) Being suggestive of how the critique of social conditions or practices could be met (as a safeguard against unrealistic and destructive negativism).

Based on these principles, the first question that researchers need to ask concerns the status of empirical data. If capabilities research is normative, i.e. wants to change the world, then one has to determine what role empirical research can play. The methodologies typically employed with critical theory can be helpful in dealing with ICT. Critical work that looks at the linguistic construction of technology is important to unpack black boxes that determine affordances and mediations of technology. This type of work is closely aligned with some of the work currently done in ethics and

ICT, such as disclosive ethics [64], [65] (Brey, 2000; Introna, 2005). An understanding of how language is used to portray particular technologies and projected developments can also be conducive to better design of technologies, such as suggested by value-sensitive design [66] (van den Hoven, 2008). CA-based methods seem to be uniquely suited to describing technologies and evaluating different options. Many ICTs have potentially far-ranging consequences and design decisions that aim to be conducive to justice and emancipation have to rely on some sort of measure that will allow comparisons of different options or outcomes. Such work could be supported and underpinned by critical perspectives, for example by questioning participants' or experts' opinions or conducting ideology critiques of capability measures.

A further point of interest is that of reflexivity. Reflexivity is often described as a core characteristic of the critical approach [67], [68], [69]. (Kvasny & Richardson, 2006; Richardson & Robinson, 2007; Doolin & McLeod, 2005). This is based on the recognition that ideologies, hegemonies, prejudices, reifications etc. cannot be overcome. Where methodologies are seen in the positivist tradition as means of ensuring a positive outcome of research they can easily turn into ideologies themselves [70] (Wastell, 1996). An essentialist take of the capability approach or a simplistic and mechanistic application of the CA as a measurement tool could potentially lead to the reification of beliefs and assumptions about human development and thereby take on a hegemonic role. Reflexivity allows critical scholars to engage in discourses without falling prey to the same problems that they diagnose in non-critical work. Beyond identifying and measuring capabilities of the individuals involved in the research, this continuous reflexivity should lead to discourses that allow exposing and addressing issues such as ideology, hegemony, reification, false consciousness etc. This will not solve them and make them go away but will ensure that they are recognised and considered. It also means that alternative concepts and views can be developed which overcome these problems.

IV. CONCLUSION

This paper argues that what we refer to as *critical theory of ICT* can be a good supplement to the capability approach in addressing issues related to technology and human development. We discuss three areas where critical theory can make a contribution to the capability approach. Firstly, CT provides a critical account of individual agency – we propose the concept of *situated agency* to signify individual agency not only as a product of specific socio-historical settings, but also subjected to hegemony of ideologies (e.g. values, beliefs, knowledge systems), and involved in the

production and reproduction of these socio-historical structures and ideological tenets. Secondly, CT provides a more sophisticated and critical account of technology beyond the simplistic notion of goods and resources, highlighting the interpretive flexibility and hegemonic potential of technology and its entanglement in power relationships. Thirdly, CT generates some methodological implications that can reduce the risk of the CA being applied as a simplistic measurement tool by sensitising towards reification and hegemonic potential of scientific methods, and emphasising the reflexivity of researchers.

Table 1 summarises the topics covered in this paper where critical theory or CTICT can contribute to the application of the capability approach on technology and development.

TABLE I. CONTRIBUTION OF CRITICAL THEORY TO THE CAPABILITY APPROACH

	Sen's Capability Approach	Critical Theory
Comparative vision of human development	Development as freedom, or removal of unfreedoms that restrict individuals from exercising their reasoned agency;	Emancipation, or removal of injustice, alienation and domination.
Individual Agency	Central to the capability approach, the basis of addressing deprivation; embedded in socio-cultural conditions;	Emphasis on the effect of social structures on individual agency, especially through hegemony of ideology;
Technology	In ICTD studies usually regarded as commodities, i.e. goods and resources; implicitly perceived to be neutral;	CTICT highlights ideological qualities and hegemonic functions of technology; sensitive to interpretive flexibility of technology and its role in distribution of power;
Methodology	Can be applied in many different ways; the more practical application is to be used as development measurement or evaluative tool;	Sensitive to power and political issues; emphasis on reflexivity of researchers; sensitive to reification and hegemonic potential of knowledge and methodologies;

Meanwhile, critical scholars could benefit from the CA's insight into real freedoms and use this insight to move towards more constructive forms of critique. Giving more weight to the positive side of technology might allow for a more balanced view. In many cases CTICT tries to debunk positive myths by showing that there are alternative stories to be told, for example by Cukier et al. [71] who show the one-sidedness of media coverage of e-teaching. While these interventions from the critical perspective are important and valuable, they

may run the risk of being one-sided in the other direction. This is not a fundamental problem for critical scholars who would generally be sceptical of claims to objective description, but it may run the risk of alienating individuals who enjoy and benefit from particular ICTs. Critical scholars need to recognise that positive appreciations of technology or the socio-economic background they come from are not necessarily expressions of false consciousness but may be genuine and deserving of respect. By seeing ICT as means to development and asking questions about what conversion factors need to be in place to facilitate the achievement of potential freedom that technology provides, the CA may point to a constructive way of engaging in such discourses.

The next step will be to engage in empirical research that uses the conceptual argument put forward in the present paper. As both CA and CT aim to be applied and practical, such empirical research will be the natural way of finding out whether the complementarity of the two approaches truly lends itself to improving practical outcomes. An important topic is to evaluate the impact of technology on development from a critical capabilities perspective. Other research topics include the socio-economic basis of technology for development, in particular issues surrounding the capitalist structure of societies and organisations employing information systems. This includes classical topics such as gender, race, class but also managerialism or digital divides and the discourses on ICT adoption and social development. We hope that the present paper provides some conceptual resources that can be conducive to both work building on CA and CT in ICT and beyond.

REFERENCES

- [1] Sen, A. *Commodities and Capabilities*. Amsterdam: North-Holland. 1985a
- [2] Gasper, D. What is the capability approach? Its core, rationale, partners and dangers. *The Journal of Social Economics*, 2007, 36: 335-359.
- [3] Deneulin, S., Nebel, M., Sagovsky, N., eds., *Transforming Unjust Structures: The Capability Approach*. Dordrecht: Springer. 2006
- [4] Sen, A. *Development as Freedom*. New York.: Knopf. 1999
- [5] Garai, Atanu and Shadrach, B., *Taking ICT to Every Indian Village: Opportunities and Challenges*. One World South Asia, 2006.
- [6] Madon, S. Evaluating the Developmental Impact of E-governance Initiatives: An Exploratory Framework. *Electronic Journal of Information System in Developing Countries*, 2004, 20(5), 1-13.
- [7] Johnstone, J., Technology as empowerment: a capability approach to computer ethics. *Ethics and Information Technology*, 2007.9, 73-87.
- [8] Gigler, Bjorn-Soren. "Including the excluded: can ICTs empower poor communities?, Towards an alternative evaluation framework based on the capacity approach." 4th International Conference on the Capability Approach, 2004, Sept.5-7, 2004 . Pavia, Italy : University of Pavia.

- [9] Wresch, W., Progress on the global digital divide: an ethical perspective based on Amartya Sen's capabilities model. *Ethics and Information Technology*, 2009, 11(4), 255-263.
- [10] Zheng, Y. and Walsham, G. , "Inequality of what? Social exclusion in the e-society as capability deprivation", *Information Technology and People*, 2008, 21(3), pp. 222-243.
- [11] Zheng, Y., Different spaces for e-development: What can we learn from the capability approach. *Information Technology for Development*, 2009, 15(2), 66-82.
- [12] Kleine, D. ICT4what? - using the choice framework to operationalise the capability approach to development. In Proceedings of the 3rd international Conference on information and Communication Technologies and Development (Doha, Qatar, April 17 - 19, 2009). IEEE Press, Piscataway, NJ, 2009 , pp.108-117.
- [13] Walsham, G. *Making a World of Difference: IT in a Global Context*. Chichester: Wiley. 2001
- [14] Bailur, S. The challenges of community participation in rural information systems projects. Paper presented at the IFIP 9.4 Working Group on Social Implications of Computers in Developing Countries: Taking Stock of E-development, Sao Paulo.2007.
- [15] Sen, A. Gender and Cooperative Conflict. In I. Tinker (Ed.), *Persistent Inequalities* (pp. 123 - 149). New York and Oxford, UK: Oxford University Press. 1990a.
- [16] Sen, A. *Identity and Violence: The Illusion of Destiny*. New York: Penguin Books. 2006.
- [17] Sen, A. Well-being, Agency and Freedom. *The Journal of Philosophy*, LXXXII(4), 169-221. 1985b.
- [18] Robeyns, I. The Capability Approach in Practice. *The Journal of Political Philosophy*, 4(3), 351-376. 2006.
- [19] Sen, A. *Inequality Reexamined*. Oxford: Oxford University Press. 1992.
- [20] Sen, A. *Choice, Welfare and Measurement*. Oxford: Basil Blackwell. 1982.
- [21] Sen, A. Capability and Well-being. In M. Nussbaum, & A. Sen (Eds.), *The Quality of Life*. Oxford: Clarendon Press. 1993.
- [22] Alkire, S. *Valuing Freedom: Sen's Capability Approach and Poverty Reduction*, Oxford: Oxford University Press. 2002.
- [23] Robeyns, I. *Gender Inequality: A Capability Perspective*. Unpublished PhD dissertation, Cambridge University, Cambridge. 2002.
- [24] Sen, A. Justice: Means versus Freedoms. *Philosophy and Public Affairs*, 1990b, 19(2), 111-121.
- [25] Robeyns, I. The Capability Approach: A Theoretical Survey. *Journal of Human Development*, 2005, 6(1), 93-114.
- [26] Nussbaum, M. C. *Women and Human Development: the Capabilities Approach*. Cambridge: Cambridge University Press. 2000.
- [27] Clark, D. A. Capability Approach. In D. A. Clark (Ed.), *The Elgar Companion to Development Studies*, Cheltenham: Edward Elgar, 2006, pp. 32-45
- [28] Orlikowski, W. J., & Baroudi, J. J. Studying Information Technology in Organizations: Research Approaches and Assumptions. *Information Systems Research*, 1991, 2(1), 1-28.
- [29] Howcroft, D., & Trauth, E. M. The implications of a critical agenda in gender and IS research. *Information Systems Journal*, 2008, 18(2), 185-202.
- [30] Stahl, B. *Information Systems: Critical Perspectives* (Routledge Studies in Organization and Systems). Routledge. 2008a.
- [31] Brooke, C. (Ed.). *Critical Management Perspectives on Information Systems (1st ed.)*. Butterworth Heinemann. 2009.
- [32] Mayasandra, R., Pan, S. L., & Myers, M. D. Viewing Information Technology Outsourcing Organizations through a Postcolonial Lens. In E. Trauth, D. Howcroft, T. Butler, B. Fitzgerald, & J. DeGross (Eds.), *Social Inclusion, Societal and Organizational Implications for Information Systems*: 2006, pp. 381 - 396. Springer.
- [33] Jackson, P., Gharavi, H., & Klobas, J. Technologies of the self: virtual work and the inner panopticon. *Information Technology and People*, 2006, 19(3), 219 - 243.
- [34] Stahl, B. C. The ethical nature of critical research in information systems. *Information Systems Journal*, 2008b, 18(2), 137-163.
- [35] Cecez-Kezmanovic, D. Basic Assumptions of the Critical Research Perspectives in Information Systems. In: Howcroft, Debra & Trauth, Eileen M. (eds.) *Handbook of Critical Information Systems Research: Theory and Application*. Cheltenham: Edward Elgar, 2005, pp.19 - 46.
- [36] Falconer, D. A Demographic and Content Survey of Critical Research in Information Systems for the Period 2001 - 2005. *Communications of AIS*, 2008(22), 547-568.
- [37] Brooke, C. What does it mean to be 'critical' in IS research? *Journal of Information Technology*, 2002, 17, 49-57.
- [38] Feenberg, A. *Critical Theory of Technology* (New Ed.). Oxford University Press Inc, USA. 1993.
- [39] Feenberg, A. *Questioning Technology* (1st ed.). Routledge. 1999.
- [40] Feenberg, A. From Critical Theory of Technology to the Rational Critique of Rationality. *Social Epistemology*, 2008a, 22(1), 5-28.
- [41] Crocker, D. A. *Ethics of Global Development: Agency, Capability, and Deliberative Democracy*, Cambridge University Press, Cambridge. 2008.
- [42] Marcuse, H. *One-Dimensional Man: Studies in the Ideology of Advanced Industrial Society* (1st ed.). Routledge. 2002.
- [43] Devereux, S. *Sen's Entitlement Approach: Critiques and Counter-critiques*. Oxford Development Studies, 2001, 29(3), 245-263.
- [44] Navarro, V. Development and Quality of Life: A Critique of Amartya Sen's Development As Freedom. *International Journal of Health Services*, 2000, 30(4), 661 - 674
- [45] Robeyns, I. Sen's Capability Approach and Feminist Concerns. In *The Capability Approach: Concepts, Measures and Applications*. Cambridge University Press, 2008, pp. 82-104.
- [46] Freeden, M. *Ideology: A Very Short Introduction. Very short introductions*. Oxford: Oxford University Press. 2003.
- [47] Hawkes, D. *Ideology. The new critical idiom* (2nd ed.). London: Routledge. 2003.
- [48] McLellan, D. *Ideology*. (2nd ed.) Concepts in the social sciences, Buckingham: Open University Press. 1995.
- [49] Stewart, K. J., & Gosain, S. The impact of ideology on effectiveness in open source software development teams. *MIS Quarterly*, 2006, 30(2), 291-314.
- [50] Gouldner, A. W. *The Dialectic of Ideology and Technology: The Origins, Grammar and Future of Ideology*. Critical social studies. London: Macmillan. 1976.
- [51] Kincheloe, J. L., & McLaren, P. Rethinking Critical Theory and Qualitative Research. In N. K. Denzin & Y. S. Lincoln (Eds.), *The SAGE Handbook of Qualitative Research* (3rd ed). Thousand Oaks: Sage Publications. 2005., pp. 305 - 342
- [52] Foucault, M. , *Discipline and Punish: The Birth of the Prison*, Penguin Books, London. 1977.
- [53] Foucault, M. , *Power/Knowledge: Selected Interviews and Other Writings (1972-1977)*, edited by Colin Gordon, Harvester, London. 1980.
- [54] Cooke, B. and Kothari, U. (Eds) , *Participation: the new tyranny?*, Zed Books, London. 2001.
- [55] Kothari, U. , "Power, knowledge and social control in participatory development", in Cooke, B. and Kothari, U. (Eds), *Participation: the new tyranny?*, Zed Books, London. 2001.p.139-152

- [56] Schot, J., & Rip, A. The past and future of constructive technology assessment. *Technological Forecasting and Social Change*, 1996, 54(2-3), 251-268.
- [57] Brey, P. The Technological Construction of Social Power. *Social Epistemology*, 2008, 22(1), 71-95.
- [58] McAulay, L., Doherty, N., & Keval, N. The stakeholder dimension in information systems evaluation. *Journal of Information Technology*, 2002, 17(4), 241-255.
- [59] Saravanamuthu, K. Information technology and ideology. *Journal of Information Technology*, 2002, 17, 79-87.
- [60] McGrath, K. Doing critical research in information systems: a case of theory and practice not informing each other. *Information Systems Journal*, 2005, 15(2), 85-101.
- [61] Feldman, S. Social Development, Capabilities, and the Contradictions of (Capitalist) Development, In S. L. Esquith and F. Gifford (Eds.), *Capabilities, Power, and Institutions: Toward a More Critical Development Ethics*. The Pennsylvania State University Press, Pennsylvania. 2010.
- [62] Klein, H. K. Critical Social IS Research Today: A Reflection of Past Accomplishments and Current Challenges. In C. Brooke (Ed.), *Critical Management Perspectives on Information Systems* Oxford: Butterworth Heinemann. 2009, pp. 249-272
- [63] Basden, A. The critical theory of Herman Dooyeweerd? *Journal of Information Technology*, 2002, 17, 257-269.
- [64] Brey, P. Disclosive Computer Ethics: Exposure and Evaluation of Embedded Normativity in Computer Technology, Presented at the CEPE2000 Computer Ethics: Philosophical Enquiry, Dartmouth College. 2000
- [65] Introna, L. D. Disclosive Ethics and Information Technology: Disclosing Facial Recognition Systems. *Ethics and Information Technology*, 2005, 7(2), 75-86.
- [66] van den Hoven, J. Moral Methodology and Information Technology. In K. Himma & H. Tavani (Eds.), *The Handbook of Information and Computer Ethics* WileyBlackwell. 2008, pp. 49-68
- [67] Kvasny, L., & Richardson, H. Critical research in information systems: looking forward, looking back. *Information Technology & People*, 2006, 19(3), 196-202
- [68] Richardson, H., & Robinson, B. The mysterious case of the missing paradigm: a review of critical information systems research 1991-2001. *Information Systems Journal*, 2007, 17(3), 251-270.
- [69] Doolin, B., & McLeod, L. Towards Critical Interpretivism in IS Research. In D. Howcroft & E. Trauth (Eds.), *Handbook of Critical Information Systems Research: Theory and Application* Cheltenham: Edward Elgar Publishing Ltd. 2005, pp. 244 - 271
- [70] Wastell, D. G. The fetish of technique: methodology as a social defence. *Information Systems Journal*, 1996, 6(1), 25-40.
- [71] Cukier, W.; Middleton, C. & Bauer, R. "The Discourse of Learning Technology in Canada: Understanding Communication Distortions and the Implications for Decision Making," in: Wynn et al. (2003), pp. 197 - 221